

Integrated Color LED Chip

ABSTRACT

A method and apparatus for achieving multicolor displays using an integrated color chip is provided. The integrated color chip contains one or more multicolor generation sites on a single substrate. Each multicolor generation site is comprised of two or more light emitting regions in close proximity to one another, the number of light emitting regions per site dependent upon the number of required colors. The active light generation system for each light emitting region, e.g., an LED, is preferably identical in device structure although size and shape may vary. In order to achieve the desired colors, one or more light conversion layers are applied to individual light emitting regions. Each light emitting region may also include index matching layers, preferably interposed between the outermost surface of the light emitter and the light conversion layer, and protective layers. In order to minimize cross-talk and achieve improved contrast, opaque material is preferably deposited between adjacent light emitting regions. Cross-talk may also be minimized by locating the light emitting regions on a substantially non-reflective substrate.